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Cerianthids (Anthozoa, Coelenterata) from Kii Region, Middle Japan*

By

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内田紘臣**: 紀伊地方産ハナギンチャク類（腔腸動物・花虫類）

Cerianthid is the anemone-like Anthozoa with two series of tentacular crowns, and inhabits in the soft tube made by self mucus secretion. According to peculiar mode of multiplication of mesenteries, cerianthids are treated as a distinct order CERIANTHARIA among the subclass Hexactiniae (HERTWIG, 1882; McMURRICH, 1910).

Previous knowledge of the taxonomy and morphology of the Japanese Ceriantharia is very poor. Previous records are shown in Table I. Except for two unidentifed specimens described by WASSILIEFF, six records in seven are original descriptions for new species. *C. orientalis* VERRILL 1865 was once recorded only by WASSILIEFF from Japan up to the present, except for the original record by VERRILL from Hong Kong. Recently, UCHIDA (1961) treated *C. misakiensis* NAKAMOTO, 1923 as a synonym of *C. filiformis* CARLGREN 1922, and also *C. magnus* NAKAMOTO, 1919 as a synonym of *C. orientalis* VERRILL 1865. Further records of these cerianthids are quite wanted, since the original records were appeared, with the exception of *C. filiformis* CARLGREN, which is the most familiar cerianthid in shallow waters of the Pacific coasts in middle part of Japan. Although seven species of cerianthids are hitherto

Table 1. Previous records of Japanese cerianthids.

Species	Authors	Localities
Cerianthus stimpsonii	VERRILL (1865)	Bonin Islands
Pachycerianthus benedeni	ROULE (1904)	Inland Sea
Cerianthus orientalis Verrill (?)	WASSILIEFF (1908)	Sagami Bay
Cerianthus sp. (?)	WASSILIEFF (1908)	Sagami Bay
Cerianthus sp. (?)	WASSILIEFF (1908)	Sagami Bay
Cerianthus magnus	NAKAMOTO (1919)	Sagami Bay
Cerianthus filiformis	CARLGREN (1922)	Sagami Bay
Cerianthus japonicus	CARLGREN (1922)	Sagami Bay
Cerianthus misakiensis	NAKAMOTO (1923)	Sagami Bay

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known from the Japanese water, only one species (*C. filiformis*) is well recognized.

The author has collected three species of cerianthids around the Kii Peninsula, middle Japan. These are two species of the genus *Cerianthus,* and a species of *Pachycerianthus.* A species of *Cerianthus* seems to be new to science.

Family **CERIANTHIDAE** CARLGREN, 1912

Ceriantharia without acontioids nor cnidorages.

Genus **Pachycerianthus** ROULE, 1903

Cerianthidae with second couple of protomesenteries (P_2) short and sterile. The first couple of metamesenteries (M_1) longest.

Pachycerianthus magnus (NAKAMOTO, 1919)

[Japanese name: Hime-hanaginchaku]

(Fig. 1)

Cerianthus magnus NAKAMOTO, 1919, p. 119.
Pachycerianthus magnus: UCHIDA, 1975, pp. 68 & 296; 1978, p. 15; 1979, p. 108.
Cerianthus mana: FISHELSON, 1970, p. 109.
Nec Cerianthus maua CARLGREN, 1900, p. 7.

Column is cylindrical with about 100–150 mm long and 30–35 mm wide. Aboral side is hemispherical with an aboral pore. Marginal and oral tentacles are about 120 in number each. They are 100–150 mm and 20 mm long respectively. Marginal ones are long and slender (3 mm wide). Column is pale brown, but the upper part near the oral margin is chocolate brown in color. Coloration of tentacles is in two types, one being dark purple, and another orange in color. In both color types, the variations are from deep color to pale almost colorless. Each tentacle on both marginal and oral series has two longitudinal colorless stripes along its whole length. One stripe locates in the inner surface of each tentacle, forming its median line, and another in the outer surface, just opposite position against the inner stripe. In orange type, proximal part between each two marginal tentacles is pale brown, and oral disk between marginal and oral tentacles is dark brown with some paler radial rays. Each of the rays corresponds to each of the inner-most and the second cycles of marginal tentacles. The rays corresponding to the inner-most tentacles are wider than the others. Oral tentacles are dusky reddish orange, and proximal part of them is paler. In purple type, the oral disk is uniformly same color as that of marginal tentacles, and without color patterns. The individual color variation of the oral tentacles is occurred. Some one has dark purple marginal tentacles and colorless oral ones, and another one has paler purple marginal ones but dark purple oral ones. Some specimens have the marginal tentacles with circular pale markings along their whole length, in addition to two longitudinal stripes. The marginal tentacles of those specimens are seen brindled.

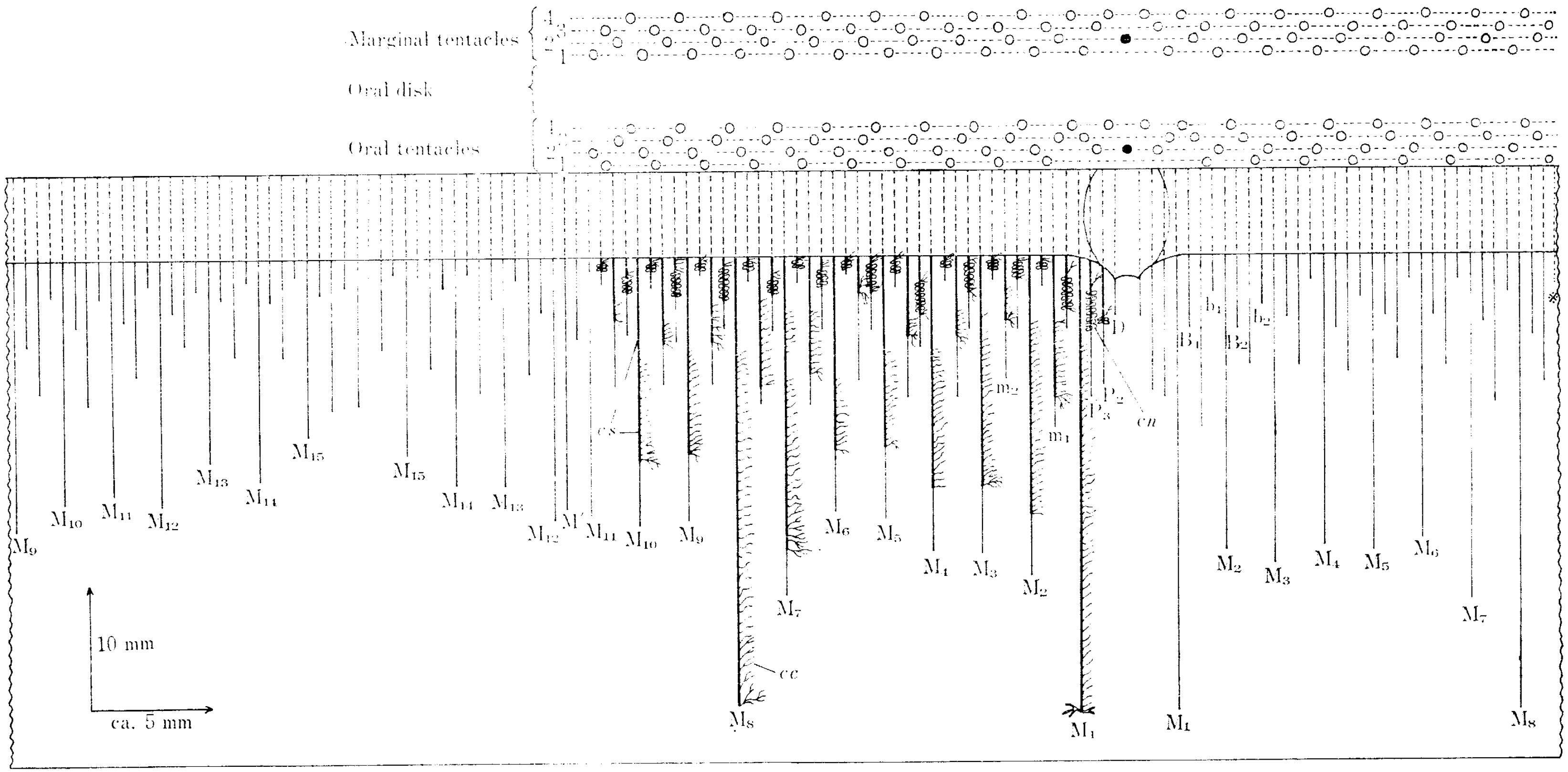

Fig. 1. Diagram of the arrangement of tentacles and mesenteries in *Pachycerianthus magnus* (NAKAMOTO, 1919). Transverse scale is adapted only for the level of actinopharynx. B: major one of micromesenteris, b: minor one of micromesenteries, *cc*: raspedoneme, *cn*: cnido-glandular tract, *cs*: ciliated tract, D: directive mesentery, M: major one of macromesenteries, m: minor one of macromesenteries, P_2: the second protomesentery, P_3: the third protomesentery, ●: directive tentacle, ※: damaged mesentery.

The arrangement of marginal tentacles (Fig. 1) is 2(dt)431|4231|4231|4231|⋯. That of oral tentacles is 2(dt)423|4312|4312|4312|⋯. On the observations on fixed specimens (Fig. 1), actinopharynx is 7 mm long, siphonoglyph, running whole length of actinopharynx, is rather narrow, and occupies six mesenteries. Hyposulcus is more or less indistinct and occupies less than 1/20 length of siphonoglyph. Hemisulci, indistinct, continue down to the directive mesenteries. Directive mesenteries (D) are much shorter (3 mm long) than siphonoglyph (9 mm long), and have not any kinds of accessories. The space between two directives is twice as wide as the space between any other two mesenteries. The second protomesenteries (P_2) are steril, and are more than twice longer (9.5 mm) than the directives. Very short cnidoglandular tract is in the distal-most part of the ciliated tract, and a few (1 or 2) craspedoneme presents just above them. Almost distal half of P_2 is free from the accessories. The third protomesenteries (P_3) are fertile and longer a little than P_2. The proximal half is ciliated tract same as P_2, but cnidoglandular tract is much longer (3.2 mm) than P_2 (0.3 mm). A few craspedoneme is just above cnidoglandular tract same as P_2. Metamesenteries are arranged in MBmb. All macromesenteries (M and m) are fertile. In micromesenteries, B_4 only is fertile, and the rests are all sterile. M_1 mesenteries are nine-tenthes as long as column, and never reach to aboral pore. Whole length of each M_1 is occupied by ciliated tract, and distal five-sixthes of ciliated tract bear craspedonemes. B_1 mesenteries are almost same structure as P_3, but shorter (about a half length of P_3), and with craspedonemes at the distal part just above cnidoglandular tract. m_1 mesenteries are shorter than a half of M_1, with a distal free part, and with craspedonemes along the considerable length. b_1 mesenteries are the same structure as P_2, but much more shorter (about a quarter as long as P_2). After the second quartette, M, B, m, and b mesenteries are quite same structure as m_1, B_1, m_1, and b_1 respectively. An exception is the case of few M mesenteries situated at the midway to dorsal (M_8 in the case of Fig. 1). These mesenteries are abnormally long with ciliated tract on their whole length, as same as M_1 mesenteries. B mesenteries are almost same length in all quartettes (5–6 mm long), and b mesenteries are also almost same (2 mm long). About m mesenteries, all are almost same length, but m_1 are somewhat longer than the rest. The length of M mesenteries is decreased in falling away from the M_1 or abnormally long M (M_8 in the case of Fig. 1) mesenteries.

The development of embryos is directive.

Habitat: This species is common in the shallow water areas in the depth range of 5–20 m. At Kushimoto (Fig. 3), this species is common in the small coral sand flats distributed among the rocky shores in open sea area. At Taichi, the species is common in the pebbly flat with little muddy cover in semi-sheltered water area (Moriura Bay).

Pholonis australis lives in commensal with the tube of this species.

Remarks: Hitherto known species of *Pachycerianthus* are eleven (ARAI, 1965, 1971). *P. magnus* is easily distinguished from *P. aestuari* (TORREY & KLEEBERGER, 1909), *P. insignis* CARLGREN, 1951, and *P. solitarius* (RAPP, 1829). These three species have m mesenteries of almost same length as M mesenteries, but *P. magnus* has m mesenteries of much shorter than M mesenteries. *P. magnus* is also easily distinguished from *P. benedeni* ROULE, 1904, *P. fimbriatus* McMURRICH, 1910 (=*P. torreyi* ARAI, 1965), *P. maua* (CARLGREN, 1900), and

P. plicatus CARLGREN, 1922. These four species have M_1 mesenteries of much longer than all other M mesenteries. *P. bicyclus* (TORELLI, 1961) has two cycles of marginal tentacles instead of four cycles. Furthermore *P. bicyclus* has P_2 mesenteries without craspedonemes.

P. magnus closely resembles *P. dohrni* (v. BENEDEN, 1909), *P. monostichus* McMURRICH, 1910, and *P. multiplicatus* CARLGREN, 1912. By the peculiar coloration of tentacles, *P. magnus* is easily distinguished from its related species. Furthermore, *P. dohrni* has long P_2 mesenteries, which reach to midway down to the column. *P. monostichus* has much shorter directive mesenteries comparing with the other protomesenteries (P_2 and P_3), and M_1 mesenteries have non-ciliated tract in the distal-most part in *P. monostichus*. *P. multiplicatus* has the mesenteries of P_2 and B with long cnidoglandular tracts.

The external appearance of *Cerianthus nobilis* HADDON et SHACKLETON, 1893 in the figure of SAVILE KENT (1893, Chromo Pl. 3) somewhat resembles to this species, but the internal structure of *C. nobilis* was never given, even by HADDON (1898). Coloration of tentacles and column (and absence of the aboral pore ?) merely distinguish *C. nobilis* from *P. magnus*.

According to the figure (Fig. 7) and the ecological description of *Cerianthus mana* (Is it a misprint of *Cerianthus maua* CARLGREN, 1900 ?) in FISHELSON (1970), his cerianthid is surely *P. magnus*. It can be clearly seen that his cerianthid has the tentacles with longitudinal colorless stripes.

The color variety seems to be genetic. One purple specimen, which is reared together with two other purple specimens, may spawned, and 43 minute juveniles were found in an aqualium tank on January 8, 1978. The oral disk was about 2 mm in diameter. The juveniles may be reared in the same tank under the same condition. Now, 21 young specimens are living in the same tank. Five are orange type, and 16 are purple type with various color variety. Two in the purple type have brindled tentacles. The color pattern of marginal tentacles never depends on the environmental conditions, but seems to be determined inherently.

Genus **Cerianthus** DELLE CHIAJE, 1830

Cerianthidae with the second couple of protomesenteries (P_2) longest and fertile. Arrangement of mesenteries in each quartette M, B, m, b.

Cerianthus punctatus nov. spec.

[New Japanese name: Madara-hanaginchaku]

(Fig. 2)

Column is pale salmon pink with many small irregular markings of reddish brown. Reddish brown markings are abundant in all the column, except for the aboral-most and the oral-most parts. The markings are somewhat scarce in the aboral region, and they are wanted in the oral region. These two parts where the markings are scarce or wanted are whitish in color. Oral ridge of the column is again dark in color. Marginal tentacles are transparent and almost colorless or pale salmon pink with the tips of yellowish green tint.

Each tentacle has a longitudinal row of 6–10 markings of dark purple (almost black) on inner surface along its whole length. The inner cycle (=longer) of tentacles has more markings than the outer (=shorter) ones. Each tentacle has a narrow pale reddish brown ring just above its insertion into the oral disk. Oral disk is pale yellowish brown. Inner edge of oral disk and the bases of the oral tentacles are dark reddish brown. Oral tentacles are almost same color as the marginal ones, but the transverse markings are wanted. Proximal one-third of the inner surface of each tentacle is reddish brown. Actinopharynx is pale reddish brown. The siphonoglyph and its opposite (dorsal) part of actinopharynx are whitish.

Column is conical with an expansion at the actinopharynx. It spreads its oral side as a funnel, and column makes itself slender at the middle position of actinopharynx, and again spreads as a spherical expansion. The widest part is corresponding to the distal edge of actinopharynx. Toward the aboral side from the widest part, the diameter is decreased spherically, and after that, the width is gradually decreased to the aboral end. The posture of this species much resembles the figure of *Cariantheomorpha ambonensis* (KWIETNIEWSKI) by MCMURRICH (1910, Pl. 1, Fig. 1). There is an aboral pore at the end. Column is about 50 mm long with the diameter changing 25–18–22–17~8 mm from oral to aboral. Surface of column has many transverse wrinkles of about 0.3 mm in interval, together with some indistinct irregular longitudinal ridges. The thickness of column wall is 1.2 mm, 1.5 mm, 1.6 mm, 2.1 mm and 1.2 mm, in the positions at actinopharynx, at the same level of aboral edge of actinopharynx, at the same level of aboral point of M mesenteries, at aborally one-third point of column, and at aboral part, respectively. The thickness of the mesogloea is 150 μ, 250 μ, 300 μ, 1200 μ, 1600 μ, and 400 μ at the positions of oral disk, oral tentacles, in the column at the same level of aboral part of actinopharynx, at the same level of aboral point of M mesenteries, aborally one-third point of column, and aboral part, respectively. Inside surface of column has many transversal wrinkles of 0.3 mm in interval. The wrinkles are cut off by the attaching of mesenteries. Ectoderm of column is 500 μ thick throughout, and endoderm is 300 μ thick throughout.

Marginal tentacles are 80–90 in number, and are arranged in 4 cycles (Fig. 2). The arrangement is 2(dt) 431|4231|4231|4231|⋯. Although the 4th cycle is much close to the third one, it is much difficult to distinguish between these two cycles each other. Marginal tentacles in living state in aquarium tanks change their posture. In slender (perhaps may be natural) condition, inner cycle of them are 70–80 mm long, the second cycle of them are 60–70 mm, and the third and 4th cycles of them 30–50 mm. But in staut condition of tentacles, they are much shorter and stauter, being about 20 mm long in all cycles. Marginal tentacles in fixed condition are 14–23 mm long. Inner tentacles are somewhat longer and stauter than the outers. Diameter of them is much variable for the irregular wrinkles, but is about 2–2.5 mm in diameter at the basal part. Each of marginal tentacles is generally the stautest at the point just above its base, and from this point, it gradually tapers to the point tip. But shrinks are happened irregularly, so that the tentacles are never simple slender conical form. Moreover, the inner surface of them is usually unevenness setting to the purple markings. The inner surface has projections at the purple markings. Wall of each

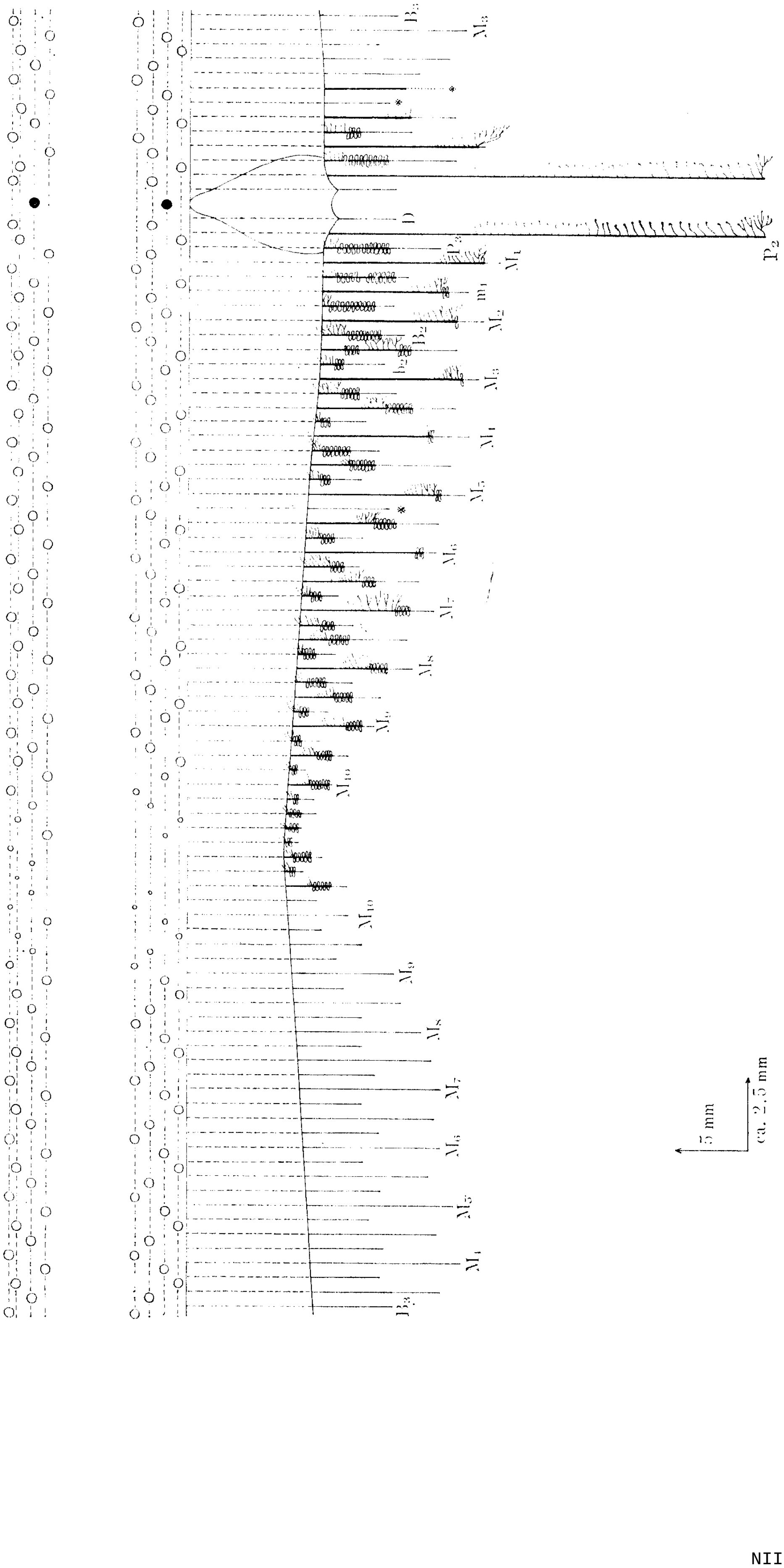

Fig. 2. Diagram of the arrangement of tentacles and mesenteries in *Cerianthus punctatus* n. sp. For signs see explanation of the Fig. 1.

tentacle is 200 μ in thickness, 100 μ thick of ectoderm, 70 μ of mesogloea, and 30 μ of endodermal layer. Mesogloea of inner part of each marginal tentacle becomes very thin at the basal part, and then continues to the mesogloea of oral disk. Mesogloea of outer part also becomes very thin at the basal part, and then continues to the mesogloea of column. Inside surface of each tentacle is smooth, but has transversal wrinkles at the places where the shrinks are happened to.

Oral tentacles are also 80–90 in number, and are arranged in 4 cycles (Fig. 2). The arrangement is 2(dt)313|4132|4312|4312|$\cdots$. They are about 15 mm long at any condition. Oral tentacles in fixed condition are 8–10 mm long. The first cycle of them, the second cycle, and the third and 4th cycles are 10 mm, 8.5 mm, and 8 mm long respectively. Diameter of basal part of them is 0.8–1.0 mm. Oral tentacles are simple cylindrical form with slender tip. There are 1–3 longitudinal grooves on inner surfase of proximal half of each oral tentacle, but it seems to be artificial for fixation. There are no anatomical differences between the grooves and other parts. Mesogloea of oral tentacles is 42 μ thick, ectoderm is 85 μ in inner side, and 150 μ in outer side, and endoderm is 85 μ thick.

Oral disk has fine transverse wrinkles of about 750 μ in interval, and shrinks up and down according to the insertions of marginal tentacles. Thickness of oral disk is 400 μ and mesogloea is very thin (80 μ).

Actinopharynx is 9 mm long at directive part, and 6.5 mm at dorsal part (Fig. 2). The surface of actinopharynx has many transversal wrinkles and longitudinal ones crossed eachother. Longitudinal ones coincide with the mesenteries. The interval of longitudinal wrinkles is 250 μ, and that of transversal ones is 500 μ. There are some five strong transverse shrinked lines, but these lines are seemed to be artificial. Mesogloea is very thin (30 μ). The aboral edge of actinopharynx is enfolded more or less conspicuously. Hyposulcus is merely developed and occupies 1/20 length of siphonoglyph. Hemisulci are also less developed and continue down to directive mesenteries.

Directive mesenteries (D) are shorter (4 mm long) than siphonoglyph (11 mm long), and have not any kinds of accessory. The space between two directives is twice as wide as the space between any other two mesenteries, quite same as the case in the previous species. The second protomesenteries (P_2) are the longest decidedly in all mesenteries, and are longer than twice of the length of M_1 mesenteries, which are the second-longest ones. They reach almost but never to the aboral pore, and they have long ciliated tracts along their whole length. Distal two-thirds of P_2 bear dence craspedonemes. Cnidoglandular tracts are wanted in P_2. P_2 mesenteries are fertile. The third protomesenteries (P_3) are about 1/3—1/4 length of P_2. They are longer than D, and shorter than M_1. The proximal half of P_3 has ciliated tract. Short proximal-most part of ciliated tract has craspedonemes, and the other part is cnidoglandular tract. P_3 mesenteries are sterile.

Metamesenteries are arranged in MBmb. All macromesenteries (M and m) are fertile and all micromesenteries (B and b) are sterile. M_1 mesenteries are the longest in metamesenteries. There is a short non-ciliated region in the distal-most part. Craspedonemes are distributed in distal 1/3 — 1/4 part of ciliated tract. The distal-most part of M_1 has craspedonemes often separated from the mesenterial membrane. Cnidoglandular tract is wanted

in M_1 mesenteries. B_1 mesenteries are a half length of M_1, and have ciliated tract on their proximal 80 % along their length. The accessories of B_1 are the same distribution as those in P_3 mesenteries. m_1 mesenteries are about eight-tenthes as long as M_1. Neighboring to the short non-ciliated region, there is a short cnidoglandular tract. Craspedonemes are distributed along the reasonable length in distal part of ciliated tract neighboring to the cnidoglandular tract. b_1 mesenteries are almost the same structure as B_1, but somewhat shorter. M_2 mesenteries are almost same as M_1, but has a very short cnidoglandular tract on the distalmost part of ciliated tract. B_2 mesenteries are quite same as B_1. m_2 mesenteries are unique. There are two cnidoglandular tracts in both side of the region where craspedonemes are distributed. b_2 mesenteries somewhat resemble to b_1, but each has a very short ciliated tract, and a very short cnidoglandular tract. m_3 mesenteries are normal with a cnidoglandular tract of reasonable length neighboring to an adequate area with craspedonemes. In more dorsal mesenteries, quartettes diminish towards the multiplication chamber. The cnidoglandular tract in M mesenteries is incleased in length toward to the dorsal. B_s, m_s, and b_s are quite the same structures as B_2, m_3, and b_2, respectively.

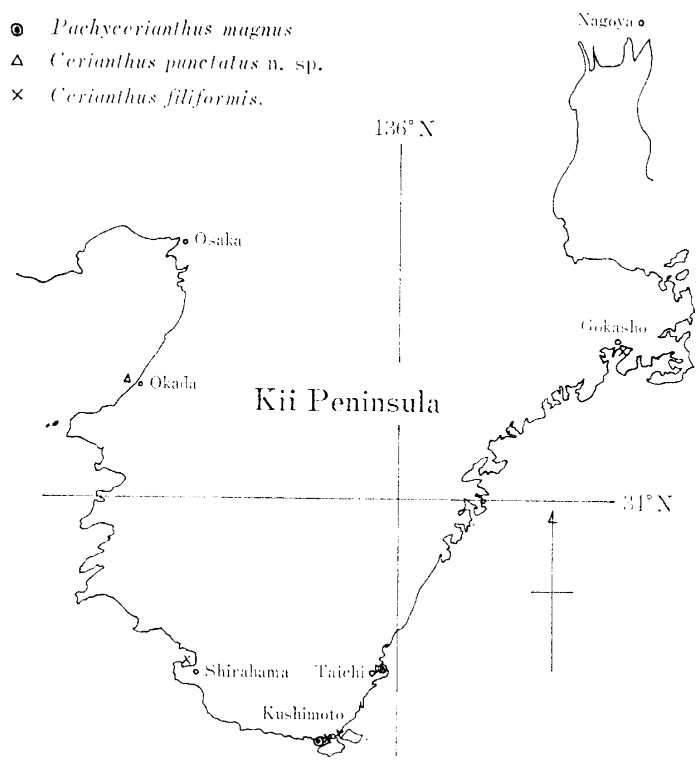

Fig. 3. Localities of three species of cerianthids in Kii region.

Locality: 2 km far from the mouth of Okada Bay (Fig. 3), Sennan Gun, Osaka Prefecture, at the depth of 20 m. Sediment is mud.

Collection: Mr. Yasunobu NABESHIMA of the Osaka Prefectural Fisheries Experimental Station, by trawl net. *Holotype* and *8 Paratypes* in SMPRS; *2 Paratypes* in NSMT.

Date: December, 1978.

Remarks: Almost 50 species names have hitherto been proposed in the genus *Cerianthus*, but after consolidation of the synonyms, and transfer to other genera, some 17 species are remained in this genus. *C. orientalis* VERRILL, 1865, *C. stimpsonii* VERRILL, 1865, *C. nobilis* HADDON & SHACKLETON, 1893, *C. andamanensis* ALCOCK, 1893, and *C. tenebrarum* ALCOCK, 1893 are known only about the external appearance. Therefore, these five species are uncertain on their genus. Although *C. stimpsonii* and *C. orientalis* has ever been recorded in Japan, these two species must be discussed about. Among remaining 12 species, *C. taedus* MCMURRICH, 1910 and *C. valdiviae* CARLGREN, 1923 are easily distinguished from the others

and *C. punctatus*. These two species have no mesenteries reached to aboral region. The following seven species are also easily distinguished from *C. punctatus*; *C. lloydii* GOSSE, 1859, *C. vogti* DANIELSSEN, 1890, *C. danielsseni* ROULE, 1903, *C. verrillii* McMURRICH, 1910, *C. roulei* CARLGREN, 1912, *C. filiformis* CARLGREN, 1922, and *C. mortensenii* CARLGREN, 1922. These seven species have several pairs of mesenteries which reach to aboral region, but the new species has only one pair (P_2) of mesenteries extending to aboral region.

Remained three species much resemble to *C. punctatus*. *C. sulcatus* KWIETNIEWSKI, 1898 has macromesenteries (M and m) of almost the same length each other, therefore it is difficult to discriminate M mesenteries from m. The resemblance also occurs between B and b. Furthermore, the arrangement of marginal tentacles is 2(dt)121|4231|3241|··· in *C. sulcatus*. The new species resembles better to *C. japonicus* Carlgren 1922 than *C. sulcatus*, but there are some important differences between these two species. The most striking point is that craspedonemes in P_2 mesenteries of the new species are much more abundant than those of *C. japonicus*. This character was used as the main reason by CARLGREN (1922), when he established new species (*C. japonicus*) distinguishing from *C. membranaceus* (SPALANZANI, 1784). Hyposulcus and hemisulci are rather well developed in *C. japonicus*, but are almost reduced in the new species. Siphonoglyph attachs to four mesenteries in *C. japonicus*, but six in *C. punctaus*. Arrangements of tentacles closely resembles between these two species, but *C. japonicus* has three cycles of marginal tentacles. Cnidoglandular tract of P_3 mesenteries is distal-more position in *C. punctatus* than in *C. japonicus*, therefore non-ciliated apex of P_2 in *C. punctatus* is much longer than that in *C. japonicus*. Craspedonemes are distributed distal-more parts of the mesenteries B and b in *C. japonicus* than in *C. punctatus*, therefore, there are some parts without craspedonemes between actinopharyngal ridge and the proximal-most craspedoneme in every B and b mesneteries in *C. japonicus*. Finally, each of some M mesenteries shows a break in the proximal part in *C. japonicus*, but breaks are never happened in any kinds of mesenteries in *C. punctatus*. *C. japonicus* has marginal tentacles without any color markings.

C. punctatus is much more related to *C. membranaceus* (SPALANZANI, 1784). The arrangements of marginal and oral tentacles are quite same in both species. The fundamental arrangements of all kinds of mesenteries also much resemble between these two. The differences between these two species are as follows. Column of *C. membranaceus* is slender cylindrical with no color markings, but that of *C. punctatus* is vase-form, with many reddish brown markings. There is color variety of tentacles without color markings in the former, but pale salmon pink with several dark purple markings in the latter. Hyposulcus and hemisulci are well developed in the former, but almost reduced in the latter. Craspedonemes in P_3, B, and b mesenteries are shifted distally in the former, so that there is a tract in some distance without craspedonemes on ciliated tract between the proximal craspedoneme and aboral ridge of actinopharynx. The same structure is observed in P_3, B, and b mesenteries in *C. japonicus*, mentioned just above. Finally craspedonemes on M and m mesenteries are much fewer in *C. membranaceus* than in *C. punctatus*.

C. stimpsonii VERRILL, 1865 was collected in Bonin Islands. Marginal tentacles are whitish, distantly annulated with brown in *C. stimpsonii*. In *C. punctatus*, marginal tentacles,

in stretched condition, look like that they have purple annulations, but the purple markings are situated only on inner surface of marginal tentacles. Each marginal tentacle in *C. stimpsonii* has a black spot at its inner base, but not in *C. punctatus*. Finally, column of *C. stimpsonii* is slender, elongated, tapering to the slender base, but that of *C. punctatus* is staut and vase-form.

C. orientalis VERRILL, 1865 was originally collected in Hong Kong, and another record was reported from Sagami Bay in Japan (WASSILIEFF, 1908). Both specimens are much larger than *C. punctatus*. The Japanese specimen was 1 m long in stretched condition (DOFLEIN in WASSILIEFF, 1908, p. 45). Column of *C. orientalis* is slender and long cylinder form. The Japanese specimen has marginal tentacles without color markings, but the Hong Kong specimen has marginal ones with pale brown spots on their inner surface. Coloration of *C. orientalis* from Hong Kong resembles to that of *C. punctatus*, but the former has the marginal tentacles of their bases greenish, instead of their distal tips, as in the latter. Size and column form appear to be shown that *C. orientalis* from Hong Kong and *C. punctatus* are different species (see the remarks in the next species).

Cerianthus filiformis CARLGREN, 1922

[Japanese name: Murasaki-hanaginchaku]

Cerianthus filiformis CARLGREN, 1922, p. 169.
Cerianthus misakiensis NAKAMOTO, 1923, p. 167.
Cerianthus orientalis: WASSILIEFF, 1908, p. 45.
Cerianthus sp. 1, & sp. 2: WASSILIEFF, 1908, p. 46.
? *Cerianthus orientalis* VERRILL, 1865, p. 196; 1868, p. 317.

The good descriptions were given by CARLGREN (1922) and NAKAMOTO (1923). The present author should describe only color valiety of tentacles and havitat they live in.

Marginal tentacles are arranged in four cycles. The second cycle is the longest, next is the first cycle, which is 80 % as long as the second, the shortest is those in the fourth cycle, which is a half length of the second cycle. The third cycle of tentacles is the length of just intermediate between the first and fourth cycles.

The most popular color pattern is as follow. All the marginal tentacles are white, semitransparent with their distal part brilliant violet in color. Violet-colored area is distal one-third in the first and the second cycles of tentacles. Violet area is a distal half in the third cycle additionally with a longitudinal mark on its inner surface at the base of each tentacle. The fourth cycle of tentacles is violet throughout their length. All the oral tentacles are pale purple with whitish tips. Each is one-third as long as marginal tentacles in the second cycle. Oral disk and oral part of column are ivory white. The violet area of marginal tentacles is developed in some specimens. The proximal part of violet area is often discontinuous forming violet bands. Banded area is sometimes distributed in whole violet-colored part. Violet bands tends to develop more on inner surface than on the outer. Some specimens have all the marginal tentacles of brilliant violet in whole their length. Such specimen has oral tentacles of dark violet. Some has the basic color of marginal tentacles being pale yellow-

wish brown instead of white. Distal colored area of marginal tentacles is dark purple in such individual, instead of brilliant violet. Column of such specimen is dusky dark purple in color.

Another color pattern of marginal tentacles is dusky orange, without any trace of violet area. Oral tentacles of this type are almost the same color as marginal ones, but somewhat dark. Some specimens have marginal tentacles with pale brown markings on their inner surface. Some other specimens have marginal tentacles of brilliant green in their proximal part. Green area is varied from only proximal part to whole length of tentacles.

Habitat: This species is common in shallow water areas in the depth of 1–50 m. In Kushimoto, this species is rare. Several specimens have ever been collected at Fukuro and Kushimoto Harbor (Fig. 3), where are somewhat sheltered areas from the open sea, and where have thick mud layer on their bottom. *C. filiformis* in Kushimoto has the coloration of popular type. In Shirahama, this species is much abundant on muddy sand slope in Hatakejima Islet, located at the recess of Tanabe Bay (Fig. 3). The specimens in Shirahama are also of popular type of coloration. This species is much abundant in Gokasho Bay in Mie Prefecture (Fig. 3). This bay enters deeply into land, and cerianthid is abundant in the area near the recess of the bay. The sediment is mud. All kinds of color varieties are observable in Gokasho Bay.

According to these observations, this species is distributed in muddy flats of well sheltered area, but not brackish.

Remarks: Arrangement of mesenteries in the original description of *C. misakiensis* NAKAMOTO, 1923 is quite identical with that in original description of *C. filiformis* CARLGREN, 1922. The specimens of these two species were collected exactly at the same locality (Misaki in Sagami Bay), therefore it is sure that *C. misakiensis* is the same species of *C. filiformis.*

C. orientalis recorded by WASSILIEFF (1908) may be this species. WASSILIEFF did not describe any characters on the mesenterial arrangement, and on coloration in living state. But locality of WASSILIEFF's material is much closed to the original locality of *C. filiformis.* Furthermore, the dimension, the coloration and external posture (Taf. II. fig. 27) of *C. orientalis* in WASSILIEFF (1908) is quite identical with the fixed specimens of *C. filiformis* collected in Kii region and also from Sagami Bay.

The second specimen of cerianthid (*Cerianthus* sp. ?) reported by WASSILIEFF (1908) seems to be the same species as mentioned by himself (WASSILIEFF, 1908, p. 46). This specimen was also collected at just the same place (Okinose in Sagami Bay) as that of his *C. orientalis.*

The third specimen of cerianthid (*Cerianthus* sp. ?) reported by him (1908) seems also to be the same species. This specimen was also collected in Sagami Bay, same as the locality of other two specimens mentioned above. The dimension, coloration of tentacles, and external posture in fixed specimen (Taf. II, fig. 28) also quite resemble to those in fixed *C. filiformis.* Absence of longitudinal grooves on column of this specimen may be due to the bad condition just befor fixation. The most striking point mentioned by WASSILIEFF is a longitudinal groove on each oral tentacle, but the same structure was observed in *C. misakiensis* (=*C. fililormis*) by NAKAMOTO (1923, p. 169, figs. 2 & 3), and it is also observed in *C. punctatus* n. sp. NAKAMOTO (1923) considered that his *C. misakiensis* was the same species as

the WASSILIEFF's third specimen, because of the presence of groove on each tentacle in both materials, and also considered that his species was distinguishable from all the other cerianthids described ever then. Groove in tentacles seems to be artificial. Condition of materials when they are fixed, and fixation are causations of this structure.

Original description of *C. orientalis* by VERRILL (1865) from Hong Kong is too simple to be discussed here. But coloration in living state of VERRILL's is included in the color variation of *C. filiformis*. Furthermore, it lives on muddy flats, same as *C. filiformis*. According to the reasons mentioned above, *C. orientalis* from Hong Kong may be the same species as *C. filiformis,* with some doubts.

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要　　約

日本産ハナギンチャク類は現在まで十分な調査が行われていない。今までに9種（WASSILIEFF, 1908 による2種の未同定種を含めて）が報告されているが，それらの記録はすべて1回限りのものである。ただ1つの例外として，ムラサキハナギンチャク（*Cerianthus filiformis* CARLGREN, 1922）のみがよく知られ，太平洋沿岸の浅海域に広く分布している。

著者はこれまでに紀伊半島沿岸のハナギンチャク3種を得たのでここに報告する。それらは *Pachycerianthus* 1種と *Cerianthus* 2種であり，*Cerianthus* 属の1種は新種と思われる。ムラサキハナギンチャクの形態はよく記載されているので，他の2種の内部形態と，ムラサキハナギンチャクの色彩変異とを記述した。

Cerianthus punctatus n. sp.（マダラハナギンチャク）はその触手配列と隔膜配列により，地中海の *C. membranaceus*（SPALANZANI, 1784）に最も類似するが，マダラハナギンチャクは触手に暗紫色の斑点列をもつ事，その他により，*C. membranaceus* から区別できる．また紀伊地方に普通に見られるムラサキハナギンチャクとヒメハナギンチャク（*Pachycerianthus magnus*）とが異った環境に分布する事を示した．すなわち，前者は内湾性の泥地に産するが，一方後者はやや開けた砂礫地に分布する．

最後にこれまでの日本産ハナギンチャクの記載を検討し，*Cerianthus misakiensis* NAKAMOTO, 1923, *C. orientalis* in WASSILIEFF, 1908 及び WASSILIEFF (1908) の未同定の2個体（*Carianthus* sp.）がムラサキハナギンチャクに属する事を考察した．

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